REMARKS

This amendment is responsive to the office action dated October 6, 2005. Claims 1-20, 22-37, and 39 are original, claim 21 is currently amended, claims 38-39 are canceled without prejudice, and claims 40-85 are withdrawn. Reconsideration is requested based on the amendments and remarks herein.

Amendments to the Specification:

Paragraph [0090] has been amended to include further identifying information for U.S. Provisional Patent Application Serial No. 60/553,803, which was incorporated into this patent application, in paragraph [0090], as originally filed. It is noted that since the incorporated patent application was filed on the same date as this non-provisional application, the serial number of the incorporated application was not available on that common filing date.

Rejection under 35 U.S.C. § 112, second paragraph:

Claims 1-39, 41-46, and 46-85, and 48-85 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 6, 10, 15, 19, 24, 28, 34, 41, 48, and 67 are rejected for reciting the term "and/or." The Office Action

asserts that this term is indefinite because "it is not clear whether both up and down are required, or whether either up or down will suffice." Applicant respectfully submits that the rejected claims are definite. Applicant contends that use of the expression "and/or" is used to indicate that either or both of the items connected by the term "and/or" are involved. Accordingly, in the context of claim 1, the term "and/or" indicates that at least some of the elements are scaled up or scaled down or scaled both up and down in a way that is non-physically proportional to one or more zoom levels associated with the zooming. In view of the foregoing, Applicant contends that the claims rejected in this section are definite under 35 U.S.C. § 112, second paragraph. Reconsideration is respectfully requested.

Claim 15 is rejected for referring back to the "storage medium" of claim 9 which does not provide antecedent basis for the quoted term. Claim 15 has been amended to depend from claim 10 which provides the needed antecedent basis. The Examiner is thanked for identifying this error. Applicant submits that claim 15, as amended, is definite. Separately, claim 21 has been amended to substitute the word "apparatus" for the word "method", as the word "apparatus" has proper antecedent basis in claim 20 from which claim 21 depends.

The Office Action indicates that there is no antecedent basis for the term "the power law" in claim 38. Claims 38-39 have been canceled without prejudice. Accordingly, the rejection of claim 38 is now considered moot. Reconsideration is respectfully requested.

Claims 2, 11, 20, and 30 are rejected for reciting the equation : $\mathbf{p} = \mathbf{d}' \cdot \mathbf{z}^{\mathbf{a}}$, (hereafter, the zoom formula) where $\mathbf{a} \neq -1$. The Office Action contends that the units on the two sides of the equation do not correspond when $\mathbf{a} \neq -1$ and that the equation is therefore "inoperative." Applicant respectfully submits that the equation is not rendered inoperative by the inequality of units and that the rejected claims are definite.

Applicant's specification indicates, in paragraph [0062], that in the simplest case, where $a = -1$, the "zoom formula" corresponds to physically proportional scaling (see paragraphs [0062] and [0069]) and is "dimensionally correct" (see line 4 of paragraph [0062]), meaning that the units for the expressions on both sides of the equation are the same.

However, when $a \neq -1$, non-physically proportional scaling is implemented (see paragraph [0063]). In this situation, the units on opposing sides of the equal sign may not be the same. However, this does not mean that the equation is inoperative. Instead, such "dimensional incorrectness" is a feature of power

law scaling as applied to physical measurement, which is known in the art. Reference is made to the article "Fractals in Pure Mathematics", a copy of which is attached hereto, and which is available on the Internet at: http://www.geocities.com/CapeCanaveral/Lab/5833/chaos211.html#2.1.1%20Fractals%20in%20Pure%20Mathematics.

By way of example only, in the above-referenced article ("Fractals in Pure Mathematics"), an equation for the length B(L) of an irregular coastline is presented, in which the coastline length is a function of the length of the measuring unit. The equation is as follows:

$$B(L) = B_0 * L^{1-d},$$

where B_0 is a constant with a dimension of length, L is a measuring unit having a dimension of length, and "d" is a dimensionless fractal dimension which is greater than 1 but less than 2.

It may be seen that for the simplest case, where d = 1, the quantity L^{1-d} simply becomes a dimensionless constant with a value of 1 (i.e. the units of "L" are raised to the exponent "0"). In this case, both sides of the equation have units of length.

As d rises in value above 1, an asymmetry in the units on the left and right sides of the equation arises and is present for all cases where d is greater than 1. We consider the case

where d = 1.5. The units on the left side do not change, and, as before are units of length, or more precisely, units of length raised to a unitary power. On the right, the exponent value of B_0 remains equal to 1. However, the exponent value to which "L" is raised is now equal to 1 - 1.5 = -0.5. Thus, the exponent value to which the length unit is raised for the product of the two quantities on the right side of the equation is now 1 + -0.5 = 0.5. Thus, the unit on the right side of the equation is length raised to the power 0.5, which contrasts with the unit of length raised to the power "1", which is present on the left side of the equation.

Applicant respectfully submits that the foregoing indicates that application of power law scaling to physical measurement may cause different physical units to exist on opposing sides of an equation without rendering the equation inoperative. Applicant further submits that while the document referenced above pertains to a different measurement and a different concept than that addressed in Applicant's specification and claims, this document nevertheless supports the principle that an equation involving power law scaling may have an asymmetry of units on opposing sides of an equation yet remain operative. Reconsideration is respectfully requested. The Examiner is invited to call the undersigned if any additional information is needed.

Restriction Requirement:

The Office Action restricts the pending claims into the two following inventions:

I. Claims 1-39, drawn to zooming; and

II. claims 40-85, drawn to blending.

Applicant elects Invention I above, without traverse.

Conclusion:

The Examiner is authorized to deduct any fees believed due from, or credit any overpayment to, our deposit account No. 11-0223. Reconsideration is respectfully requested. We respectfully request the Examiner telephone the undersigned if there are any further issues preventing reconsideration of the outstanding rejections.

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Respectfully submitted,

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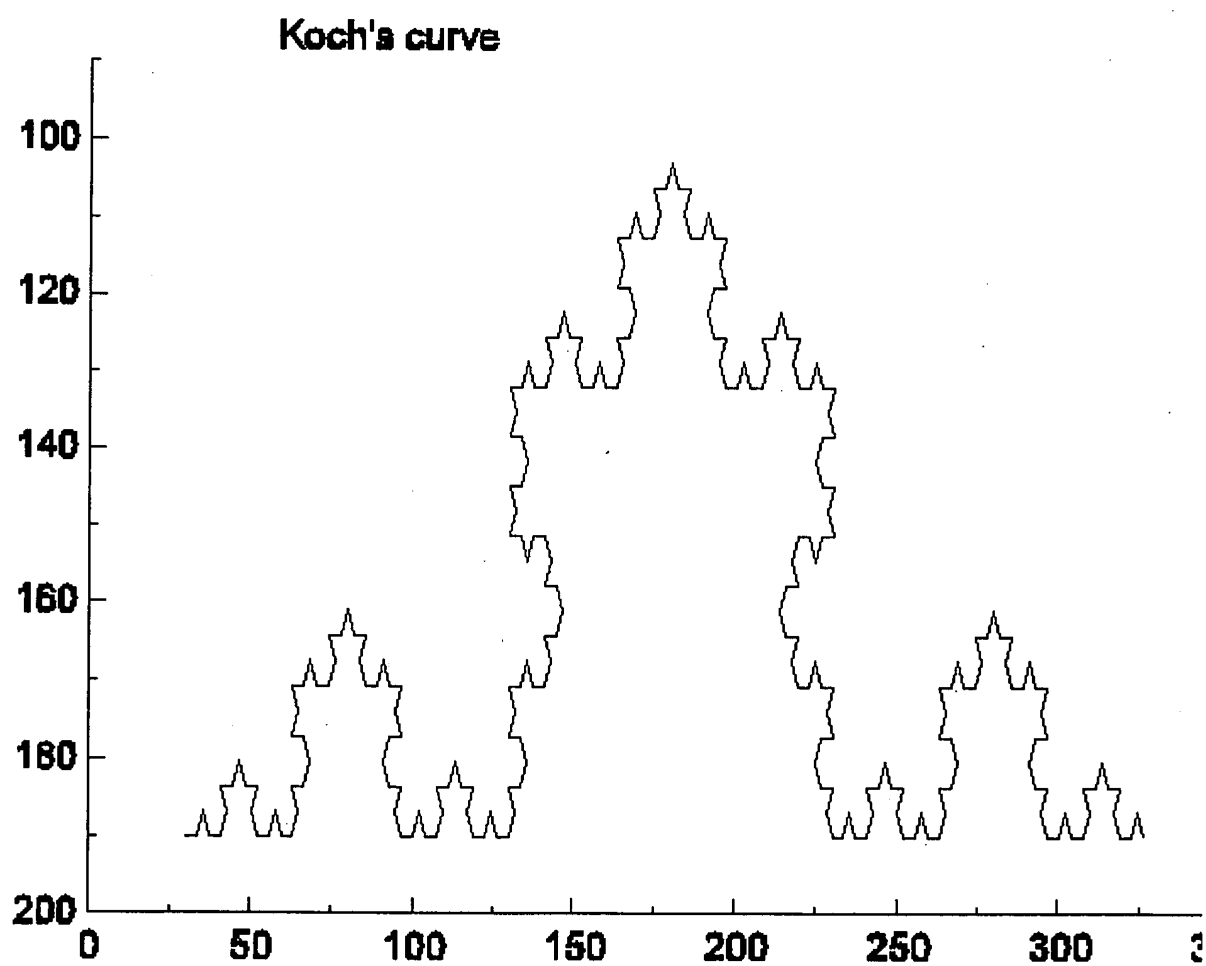
2.1.1 Fractals in Pure Mathematics

Irregular (wrinkled) patterns are often described by functions that are continuous but not differentiable. Till the late 1800s pure mathematics dealt mostly with functions which are differentiable everywhere such as the circle or ellipse. Pioneers in the study of functions which are continuous everywhere but without tangents are Karl Weierstrauss (1815-1897) who presented the Weierstrauss function in 1872, George Cantor (1845-1918) who provided the Cantor set in 1883 and Helge Van Koch (1906) who first constructed the snowflake curve(Deering and West,1992 References)). A representative example,the Koch's curve is shown in Figure 2.

FIGURE 2



Jagged boundaries represented by these functions are more common in nature than the special case of curves with tangents, such as the circle. However, real world geometrical structures were not associated with these functions till a long time after their discovery. Continuous functions which are not differentiable anywhere represent an infinite number of zigzags between any two points. The length between any two points on the curve is infinity, yet the area bounded by the curve is finite. These "monster curves" which were outside the domain of pure mathematics were ignored as a field for study by many prominent mathematicians till the late 1800s. The non-Euclidean geometry of the "monster curve" was quantified in terms of the similarity dimension by Hausdorff in 1919 References. His idea was based on scaling, which means measuring the same object with different units of measurement. Any detail smaller than the unit of measurement is discarded. The jagged "monster curves" have fractional (non-integer) dimensions. The word 'fractal' was coined by Mandelbrot(1977) as a generic name for such objects as Koch's snowflake which possess fractional Hausdorff dimension. Besicovitch(1929) References was a second major figure who had developed the background for the concept of fractional dimension. Some of the earlier studies on applications of scaling concepts are given in the following. The question of scaling and the paradigm of fractals,i.e., when can a part have the same propertiesas the whole was addressed in the 1920s and 1930s by Levy(1937) References who was concerned with the question of when a sum of identically distributed random variables has the same probability distribution as any one of the terms in the sum(Shlesinger et.al., 1987 References). The length of a fractal object,e.g. the coastline increases with decrease in the length of yardstick used for the measurement. Richardson (1960 References) came close to the concept of fractals when he noted that the estimated length of an irregular coastline or boundary $B(l)$,where l is the measuring unit is given by $B(l)=B_0 l^{1-d}$ where B_0 is a constant with dimension of length and d is the fractal dimension greater than 1 but less than 2 for the jagged coastline(West, 1990a,b References).One of the oldest scaling laws in geophysics is the Omori law(Omori, 1895 References).It describes the temporal distribution of the number of aftershocks which occur after a larger earthquake(i.e.,mainshock) by a scaling relationship.The other basic empirical seismological law,the Gutenberg-Richter law(Gutenberg and Richter, 1944 References) is also a scaling relationship,and relates intensity to its probability of occurrence(Hooge et. al., 1994 References).

The fractal dimension D in general for length scale R may be given as :

$$D = \frac{d \ln M}{d \ln R} \quad \text{-----------} (1)$$

where M is the mass contained within a distance R from a point in the extended object. A constant value for D implies uniform stretching on logarithmic scale, resulting in large scale structures which preserve their original geometrical shape. Objects in nature are in general multifractals, i.e. the fractal dimension D varies with the length scale R. The multifractal nature of fluid turbulence and scaling concepts has been discussed by Sreenivasan(1991 References) The dimension of a naturally occurring fractal is a quantitative measure of a qualitative property of a structure that is selfsimilar over some regions of space or intervals of time.